DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed July 19, 2011 is acknowledged and has been entered. Claims 7, 15 and 23 have been amended. Claims 1-32 are pending in the instant application. All rejections have been withdrawn in view of Applicants' amendment to the claims and/or comments, with the exception of those discussed below.

2. Claims 2, 9, 11, 17-21 and 26-32 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and/or species, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on October 4, 2010.

3. Claims 1, 3-8, 10, 12-16 and 22-25 have been examined in the instant application.

4. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in UK 0315020.8 on 6/26/03 and UK 0402236.4 on 2/2/04. It is noted, however, that applicant has not filed a certified copy of these applications as required by 35 U.S.C. 119(b).

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 16 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an immunogenic composition comprising a combination of 5 *C. trachomatis* antigens (PepA, LcrE, ArtJ, DNaK and CT398), does not reasonably provide enablement for a vaccine composition comprising a combination of *C. trachomatis* antigens that is less than 5 antigens. The specification does not enable any person skilled in the art to which it

pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

As stated above the specification does not enable vaccine compositions comprising the *C. trachomatis* antigens as claimed, two antigens LcrE and CT398 or LcrE and HtrA. The specification teaches that "Vaccines according to the invention may either be prophylactic (i.e. to prevent infection) or therapeutic (i.e. to treat infection), but will typically be prophylactic. Accordingly, the invention includes a method for the therapeutic or prophylactic treatment of *Chlamydia trachomatis* infection in an animal susceptible to chlamydial infection comprising administering to said animal a therapeutic or prophylactic amount of the immunogenic compositions of the invention. Preferably, the immunogenic composition comprises a combination of *Chlamydia trachomatis* antigens, said combination selected from the group consisting of two, three, four, or all five *Chlamydia trachomatis* antigens of the first antigen group. Still more preferably, the combination consists of all five Chlamydia trachomatis antigens of the first antigen group."

The specification states that Figures 8(a)-8(d) show the results obtained after administration of a combination of five different CT antigens (CT045, CT089, CT396, CT398 and CT381) with complementary immunological profiles which demonstrate that this five antigen mix is capable of providing protection against CT challenge in a mouse model of Chlamydial genital infection when used in combination with an immunoregulatory agent, such as AlOH and CpG." (p. 77) There is no enablement for a vaccine composition of less than five antigen mix. There is no indication which of the five *Chlamydia trachomatis* antigens is necessary/required to achieve vaccine protection when the vaccine composition comprises less than five *Chlamydia trachomatis* antigens, i.e. two antigens, specifically LcrE (CT089) and CT398 or LcrE and HtrA (CT823).

It is noted that there is no Figure 8(b) in the drawing set; however there are two Figure 8(a). There is no Figure 8(d) in the drawing set or recited in the Brief Description of the Drawings.

Igietseme et al (Infection and Immunity, 2000, 68/12:6798-6806) discusses the problems of Chlamydia vaccines. "Despite considerable efforts and clinical and experimental evidence suggesting that at least partial protective immunity is feasible in humans, the development of

reliable Chlamydia vaccines using conventional immunization strategies has proven to be elusive. Among other setbacks, vaccine effectiveness was relatively limited because of poor immunogenicity; more importantly, the use of inactivated whole-chlamydia agents appears to be unattractive due to likely immunopathogenic components." (p. 6803)

Factors to be considered in determining whether undue experimentation is required, are Set forth in In re Wands 8 USPQ2d 1400. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art and (8) the breadth of the claims.

Applying the above test to the facts of record, it is determined that 1) no declaration under 37 C.F.R. 1.132 or other relevant evidence has been made of record establishing the amount of experimentation necessary, 2) insufficient direction or guidance is presented in the specification with respect to vaccine composition comprising less than five *C. trachomatis* antigens having vaccine protection, 3) the relative skill of those in the art is commonly recognized as quite high (post-doctoral level). One of skill in the art would require guidance, in order to make or use vaccine composition comprising less than five *C. trachomatis* antigens having vaccine protection. Without proper guidance, the experimentation is undue. In view of all of the above, in view of the lack of predictability in the art, it is determined that it would require undue experimentation to make and use the claimed invention.

It is noted that the above enablement rejection is maintained for claim 16 only. Applicant's arguments filed April 27, 2011 have been fully considered but they are not persuasive. Applicants has asserted that the Examiner cites Igietseme et al, which was published in 2000, to support the rejection. Applicants have asserted that Igietseme et al did not have the benefit of the present specification, which specifically teaches compositions comprising combinations of two or more of a recited group of *C. trachomatis* antigens and therefore the reference is not relevant to whether the present specification enables a vaccine composition comprising fewer than five *C. trachomatis* antigens. However, it is the Examiner's position that the specification does not enable the claimed vaccine composition comprising two *C.*

trachomatis antigens, specifically LcrE (CT089) and CT398 or LcrE and HtrA (CT823). The enablement of a vaccine composition comprising combination of five different CT antigens (CT045, CT089, CT396, CT398 and CT381) does not enable a vaccine composition comprising just two antigens as specifically claimed (i.e. species election). There is no enablement for a vaccine composition of less than five antigen mix. There is no indication which of the five *Chlamydia trachomatis* antigens is necessary/required to achieve vaccine protection when the vaccine composition comprises less than five *Chlamydia trachomatis* antigens, i.e. two antigens, specifically LcrE (CT089) and CT398 or LcrE and HtrA (CT823).

Burnham et al (Nature Reviews, Immunology, February 2005, 5:149-161) discloses that "Developing a vaccine against *C. trachomatis* remains a challenge. In part, this results from our poor understanding of the regulation of the immune response in the FGT (which seems to be highly influenced by sex hormones) (BOX 3), the lack of adjuvants that target vaccines to the genital mucosa, our limited knowledge of which *C. trachomatis* antigens induce protective immune responses and the absence of tools to genetically manipulate Chlamydia spp. The observation that the immune response is directly or indirectly involved in the pathogenesis of disease caused by Chlamydia spp. also introduces further complexity to the vaccine-development process." (p.

Schautteet et al (Infectious Diseases in Obstetrics and Gynecology, Volume 2011, Article ID 963513, 9 pages) discloses that "A vaccination program is considered to be the best approach to reduce the prevalence of *C. trachomatis* infections, as it would be much cheaper and have a greater impact on controlling *C. trachomatis* infections worldwide rather than a screening program or treating infections with antibiotics. Currently, there are no vaccines available which effectively protect against a *C. trachomatis* genital infection despite the many efforts that have been made throughout the years."

Even after the filing date of the instant application the state of the art teaches that a vaccine composition comprising *C. trachomatis* antigens is still unpredictable.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 3-8, 10, 12-16 and 22-25 are rejected under 35 U.S.C. 102(a) as being anticipated by Grandi et al (WO 2003/049762, publication date June 19, 2003).

Grandi et al discloses polypeptides derived from Chlamydia trachomatis that are suitable for vaccine preparation, antigens and immunogens suitable for use in vaccine development (abstract; p. 1; claims). Grandi et al discloses that the compositions can comprise two or more proteins, Chlamydia trachomatis antigens (p. 7; claims). Grandi et al specifically disclose among others, CT398 (SEQ ID NO: 111), LcrE (SEQ ID NO: 61), HtrA (SEQ ID NO: 229), ArtJ (SEQ ID NO: 105), PepA (SEQ ID NO: 71), DnaK (SEQ ID NO: 107) and CT547 (examples; Table 1; claims). Grandi discloses the use of adjuvants in order to enhance immunogenicity (p. 7; pp 22-25).

Since the Patent Office does not have the facilities for examining and comparing applicants' proteins with the proteins of the prior art reference, the burden is upon applicants to show a distinction between the material structural and functional characteristics of the claimed proteins and the proteins of the prior art. See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

The rejection is maintained for the reasons of record. Applicant's arguments filed April 27, 2011 have been fully considered but they are not persuasive. Applicants have asserted that the rejected claims are not directed to proteins; they are directed to immunogenic compositions (claims 1-3, 10, 12-15, and 22-25) and to vaccines (claim 16) that comprise particular combinations of *C. trachomatis* antigens. Each of independent claims 1, 8, 16, and 22 requires a combination of *C. trachomatis* antigens selected from a particular group:

• claims 1 and 22 require that the combination of *C trachomatis* antigens be selected from a particular group of five *C. trachomatis* antigens: of PepA, LcrE, ArtJ, DnaK and CT398;

• claim 8 requires that the combination of *C. trachomatis* antigens must be selected from a particular group of 13 particular *C. trachomatis* antigens: PepA, LcrE, ArtJ, DnaK, CT398, OmpH-like, L7/L12, OmcA, AtoS, CT547, Enolase, HtrA, and MurG; and

• claim 16 requires that the combination be selected from the group of five or the group of eight particular *C. trachomatis* antigens.

However, it is the Examiner's position that the claimed products are directed to compositions comprising two *C. trachomatis* antigens, specifically LcrE (CT089) and CT398 or LcrE and HtrA (CT823). This is the elected species. The recitation of "immunogenic" or "vaccine" is viewed as intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Furthermore it is noted that the elected species is two antigens—LcrE and CT398 (as it relates to claims1, 3-7, 16 and 22, and LcrE and HtrA (as it relates to claims 8, 10 and 12-16) (Applicants elect Group I (claims 1-16 and 22). For claims 1-6 and 16, Applicants elect the species of two antigens (LcrE and CT398). For claims 8-16, Applicants elect the species of two antigens (LcrE and HtrA). In each case, claims 1-16 and 22-25 read on the elected species. From election filed 10/4/10)

Applicants' have asserted that "It is black letter law that a reference does not anticipate a claim unless the reference discloses all of the limitations of the claim "arranged or combined in the same way as recited in the claim." See *NetMoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) ("unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipated under 35 U.S.C. § 102."). Grandi does not disclose compositions comprising two (or more) antigens selected from either of the recited groups of antigens. Because Grandi does not disclose each element of the rejected independent claims "arranged or combined in the same way," Grandi does not anticipate any of claims 1-3, 10, 12-16, and 22-25." (Remarks, p. 15)

However, it is the Examiner's position that the prior art does indeed disclose the claimed invention. Grandi et al discloses "Immunogenic compositions used as vaccines comprise an immunologically effective amount of the antigenic or immunogenic polypeptides, as well as any other of the above-mentioned components, as needed. By "immunologically effective amount", it is meant that the administration of that amount to an individual, either in a single dose or as part of a series, is effective for treatment or prevention." (p. 24, l. 26-29) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). >"When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." Brown v. 3M, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) (claim to a system for setting a computer clock to an offset time to address the Year 2000 (Y2K) problem, applicable to records with year date data in "at least one of two-digit, three-digit, or four-digit" representations, was held anticipated by a system that offsets year dates in only two-digit formats). See also MPEP § 2131.02.< "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Note that, in some circumstances, it is permissible to use multiple references in a 35 U.S.C. 102 rejection. See MPEP § 2131.01.

The reference discloses the use of polypeptides, or antigens in a composition.

9. No claims are allowed.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. M. MINNIFIELD whose telephone number is (571)272-0860. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary B. Nickol can be reached on 571-272-0835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

N. M. MINNIFIELD
Primary Examiner
Art Unit 1645

/N. M. MINNIFIELD/
Primary Examiner, Art Unit 1645